Are Contingent Convertibles Going-Concern Capital?

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Federal Deposit Insurance Corporation
18th Annual Bank Research Conference
6 September 2018

Contingent Convertibles (CoCos)

- CoCos are bonds issued by banks that either convert to equity or have their principal written down following a triggering event.
- CoCos are viewed as superior to standard subordinated debt that absorb losses only when a bank fails (is a “gone-concern”).
- When many banks became distressed during the global financial crisis, governments injected capital into them rather than close all of them and force losses on subordinated debtholders.
- By recapitalizing a bank while it is a going-concern, CoCos could avoid a public bailout.
- Since 2009, there have been over 500 different CoCo issues that have raised more than $600 billion.

CoCo Triggers

- As initially proposed by Flannery (2005), a CoCo's conversion or write down would be triggered when the bank's stock price or market value of equity declined to a pre-specified threshold.
- However, in practice CoCos have regulatory capital triggers.
- To qualify as Basel III Additional Tier 1 (AT1) capital, CoCos must be triggered when the bank's common equity Tier 1 to risk-weighted assets (CET1/RWA) declines to at least 5.125% or when regulatory discretion forces that it be triggered.
- Since a regulatory capital ratio is slow to adjust and can be manipulated, Hart and Zingales (2010), Haldane (2011), and others question if it would trigger a CoCo while a bank is a going-concern.
- Moreover, Glasserman and Perotti (2017) believe political pressures make regulators reluctant to force losses on CoCos.

Our Paper

- We examine whether stock and bond market investors consider CoCos to be going-concern capital.
- Our model shows that if CoCos absorb losses only after a bank has failed, issuing CoCos makes the distribution of the bank's stock returns more extreme (leverage effect).
- Instead, if CoCos absorb losses while a bank is a going-concern, stock returns are less extreme after CoCo issuance (insurance effect).
- We also examine the difference between credit spreads of a bank's AT1 CoCo and Tier 2 subordinated debt before and after regulatory actions that affected CoCos' going-concern quality.
- Our findings shed light on whether CoCos deserve the status as higher-quality AT1 capital and on their ability to stabilize banks.

Related Literature

- Avdjiev, Bolton, Jiang, Kartasheva, and Bodganova (2017) and Amman, Blickle, and Ehmann (2017) find that when CoCos are issued, credit default swap (CDS) spreads on the bank's senior debt decline, especially for equity conversion (EC) CoCos. Stock returns increase only for high-trigger principal write down (WD) CoCos.

- Berg and Kaserer (2015) show that Lloyds' CoCo returns are more sensitive than other debt returns to its stock's implied volatility.

- Hesse (2016) finds WD CoCos tend to have the highest yields, followed by EC CoCos and subordinated debt.

- Our paper is unique by focusing on whether investors perceive CoCos to be going-concern capital and whether recent regulatory actions have changed this perception.

Modeling How a CoCo Changes a Bank's Stock Returns

- We construct a two-period, 3-date structural model of a bank whose asset returns are binomially-distributed each period.
- The bank's liabilities consist of senior deposits, a CoCo, and shareholders' equity.
- If assets experience a low return over the first period, the CoCo is written down with risk-neutral probability π that leads to a proportional loss to CoCo investors of (1-*w*).
- Proposition 1: Consider a bank that issues only deposits and shareholders equity versus a bank with the same deposits and equity that also issues a CoCo. If π (1-*w*) is sufficiently large (*small*), the CoCo-issuing bank has a relatively lower (*higher*) one- and two-period stock return variance.
- Intuition: Insurance from CoCos' loss absorption can offset the leverage effect of greater debt.

Testable Hypothesis and Caveats

- We test whether a bank's stock return distribution is less (*more*) extreme following CoCo issuance, which sheds light on whether investors perceive CoCos as going- (*gone*-) concern capital.

- Test Caveat 1: The model assumes that a bank's asset volatility stays constant, yet theory such as Berg and Kaserer (2015) predicts that when $w < 1$, the bank has the incentive to increase asset risk. Virtually all EC and WD CoCos have $w < 1$.

- Test Caveat 2: The decision to issue a CoCo is endogenous, and managers may do so when stock return volatility changes.

- We deal with these caveats by:
  1. Examining whether asset risk changes after CoCo issuance.
  2. Running a dynamic panel model to investigate possible reverse causality between stock return volatility and CoCo issuance.

Data and Variable Construction

- Our data cover European listed banks from 2011 to 2017 and include CoCo issuance (Bloomberg), stock returns (Datastream), and annual financial statements (Orbis Bank).

- We construct the following stock return distribution measures:
  1. *VOL*: annualized standard deviation of weekly stock returns.
  2. *N_CRASH*: number of returns > 3.09 std. dev. below mean.
  3. *CRASH_JUMP*: number of crashes – number of jumps.
  4. *NCSKEW*: negative skewness.
  5. *DUVOL*: std. dev. in crash weeks – std. dev. in jump weeks.
  6. *VaR*: Value at Risk.
  7. *ES*: Expected Shortfall.
  8. *LRMES*: Long Run Marginal Expected Shortfall.

- We also create indicator variables for a bank's CoCo issuance:
  1. $CoCo_{i,t}$ = 1 if year *t* is the year that bank *i* issues a CoCo.
  2. $Post\_CoCo_{i,t}$ = 1 if year *t* is the year after bank *i* issues a CoCo.
  3. $Pre\_CoCo_{i,t}$ = 1 if year *t* is the year before bank *i* issues a CoCo.

Does CoCo Issuance Change Asset Risk?

- There is no evidence of asset risk-shifting following CoCo issuance.

	(1) RWA ratio	(2) NPL ratio	(3) Loans/TA	(4) Securities/TA	(5) Deriv/TA
Post_CoCo	0.00456	-0.000768	-0.00195	0.00236	-0.00183
	(0.0103)	(0.00611)	(0.00620)	(0.00814)	(0.00269)
Size	-0.318***	-0.0836	-0.00643	0.0370	0.0112
	(0.118)	(0.0700)	(0.0844)	(0.0839)	(0.0175)
ROA	-0.00714	-0.0481**	0.0102	0.0116	-0.00122
	(0.0189)	(0.0204)	(0.0107)	(0.0177)	(0.00304)
Cost-income ratio	-0.00918	-0.00745	-0.00451	0.00121	0.000526
	(0.00716)	(0.0103)	(0.00478)	(0.00557)	(0.00113)
Total capital ratio	0.00731	-0.00145	-0.00335	0.00899	-0.00172
	(0.0125)	(0.0101)	(0.00808)	(0.00739)	(0.00236)
Capital quality	-0.00683	-0.00154	0.00244	0.000728	-0.00230
	(0.00760)	(0.00420)	(0.00506)	(0.00430)	(0.00143)
Bank FE	YES	YES	YES	YES	YES
Country*year FE	YES	YES	YES	YES	YES
Observations	400	379	400	388	388
R-squared	0.507	0.771	0.494	0.451	0.477
Number of banks	98	92	98	93	93

Testing Whether CoCo Issuance Changes Stock Volatility

- Consider the following panel data regression:

$$Y_{i,t} = \alpha + \beta_1 Pre\_CoCo_{i,t} + \beta_2 CoCo_{i,t} + \beta_3 Post\_CoCo_{i,t} + \gamma' Controls_{i,t-1} + \eta_{i,t}$$

where $Y_{i,t}$ is a measure of stock return volatility.

- A significant β_1 coefficient indicates potential reverse causality as a change in stock volatility predicts next year's CoCo issuance.
- β_2 indicates the contemporaneous relationship between CoCo issuance and stock volatility.
- β_3 indicates the effect of CoCo issuance on next year's stock volatility.

Equity Conversion CoCos and Stock Return Volatility

- Evidence that EC CoCos reduce most measures of volatility.

VARIABLES	(1) VOL	(2) N_CRASH	(3) CRASH_JUMP	(4) NCSKEW	(5) DUVOL	(6) LRMES	(7) VAR_0975	(8) ES_0975
Pre_CoCo_EC	5.584	0.0323	0.0257	-0.149	-0.0812	1.844	0.00101	-0.00423
	(5.686)	(0.166)	(0.229)	(0.281)	(0.193)	(1.756)	(0.00329)	(0.00388)
CoCo_EC	-11.77	-0.323**	-0.110	-0.604***	-0.321	4.156**	0.00306	-0.00738
	(9.915)	(0.146)	(0.117)	(0.227)	(0.214)	(1.817)	(0.00309)	(0.00557)
Post_CoCo_ EC	-12.77**	-0.189	-0.166	-0.361	-0.375**	-3.006*	-0.00608**	-0.0114**
	(6.034)	(0.184)	(0.301)	(0.245)	(0.166)	(1.777)	(0.00256)	(0.00496)
CoCo_Out_EC	17.40	-0.286	-0.419*	0.376	0.326*	-5.290*	-0.00397	0.000443
	(13.21)	(0.202)	(0.221)	(0.310)	(0.191)	(2.882)	(0.00450)	(0.00582)
Size	-52.68**	-0.404	0.129	0.154	-0.0106	-1.741	-0.00914	-0.0225
	(22.52)	(0.514)	(0.738)	(0.759)	(0.513)	(6.219)	(0.0145)	(0.0162)
ROA	-31.19***	-0.0824	0.00276	0.0683	-0.0123	-10.94***	-0.0168**	-0.0149**
	(8.903)	(0.116)	(0.279)	(0.236)	(0.172)	(3.582)	(0.00725)	(0.00636)
Loans/TA	35.74**	0.117	0.261	0.385*	0.377**	2.001	0.00943***	0.00809*
	(13.83)	(0.119)	(0.193)	(0.214)	(0.154)	(1.890)	(0.00349)	(0.00410)
Cost-income ratio	-2.635	0.0141	0.0173	-0.0213	0.00627	1.682*	-0.000539	0.00102
	(2.317)	(0.0413)	(0.0630)	(0.0758)	(0.0575)	(0.924)	(0.00174)	(0.00231)
Total capital ratio	-1.605	0.00684	-0.123	-0.0478	0.0171	3.294**	0.00357*	0.00389
	(4.100)	(0.0654)	(0.0883)	(0.0982)	(0.0735)	(1.590)	(0.00205)	(0.00245)
Capital quality	-1.481	-0.0843	-0.0872	-0.00188	0.0181	-0.612	0.000401	-0.000335
	(3.251)	(0.0570)	(0.0884)	(0.0836)	(0.0605)	(0.947)	(0.00106)	(0.00149)
Constant	54.57***	0.456***	0.152	0.125	0.128	34.76***	0.0543***	0.0853***
	(7.307)	(0.137)	(0.196)	(0.229)	(0.156)	(5.038)	(0.00475)	(0.00550)
Observations	400	400	400	400	400	400	400	400
R-squared	0.699	0.410	0.424	0.376	0.398	0.697	0.816	0.802
Number of banks	98	98	98	98	98	98	98	98

Principal Write Down CoCos and Stock Return Volatility

- There is no evidence that WD CoCos reduce volatility: these banks may be reluctant/less likely to impose irreversible losses on CoCos.

VARIABLES	(1) VOL	(2) N_CRASH	(3) CRASH_JUMP	(4) NCSKEW	(5) DUVOL	(6) LRMES	(7) VAR_0975	(8) ES_0975
Pre_CoCo_WD	-2.972	-0.0909	-0.0470	-0.0720	-0.0532	-0.435	-0.00188	-0.00343
	(3.413)	(0.0913)	(0.112)	(0.142)	(0.0853)	(1.641)	(0.00145)	(0.00246)
CoCo _ WD	1.491	-0.0754	-0.123	0.0209	-0.0820	1.487	-0.00313	0.000114
	(5.651)	(0.117)	(0.169)	(0.226)	(0.143)	(2.007)	(0.00237)	(0.00533)
Post_ CoCo _ WD	-3.697	-0.0585	0.0154	-0.0906	-0.107	0.976	-0.00280	-0.00499
	(5.251)	(0.144)	(0.182)	(0.160)	(0.117)	(1.606)	(0.00174)	(0.00354)
CoCo _Out_ WD	2.941	0.0823	-0.150	-0.158	0.122	0.925	0.00722**	0.00572
	(7.683)	(0.210)	(0.261)	(0.299)	(0.206)	(3.221)	(0.00319)	(0.00576)
Size	-49.26**	-0.274	0.215	0.312	0.155	-1.267	-0.00667	-0.0173
	(22.33)	(0.513)	(0.746)	(0.777)	(0.516)	(6.534)	(0.0140)	(0.0160)
ROA	-30.48***	-0.0338	0.0682	0.0989	0.00967	-10.27***	-0.0157**	-0.0136**
	(9.210)	(0.127)	(0.298)	(0.242)	(0.178)	(3.844)	(0.00766)	(0.00675)
Loans/TA	34.17**	0.152	0.304	0.412*	0.358**	2.053	0.00873**	0.00843**
	(13.56)	(0.129)	(0.195)	(0.242)	(0.162)	(1.902)	(0.00352)	(0.00423)
Cost-income ratio	-3.655	0.00971	0.0165	-0.0446	-0.0110	1.723**	-0.000445	0.000846
	(2.446)	(0.0408)	(0.0618)	(0.0735)	(0.0569)	(0.867)	(0.00179)	(0.00244)
Total capital ratio	-2.195	-0.0370	-0.178*	-0.0560	0.00825	2.597	0.00283	0.00326
	(4.088)	(0.0706)	(0.0908)	(0.0962)	(0.0714)	(1.573)	(0.00201)	(0.00234)
Capital quality	-1.154	-0.0845	-0.0873	0.00494	0.0271	-0.559	0.000579	-4.42e-05
	(3.297)	(0.0567)	(0.0879)	(0.0818)	(0.0570)	(0.908)	(0.00107)	(0.00148)
Constant	55.91***	0.335**	0.0911	0.124	0.0825	33.44***	0.0515***	0.0815***
	(7.105)	(0.130)	(0.188)	(0.210)	(0.154)	(5.249)	(0.00459)	(0.00565)
Observations	400	400	400	400	400	400	400	400
R-squared	0.691	0.374	0.417	0.364	0.385	0.689	0.815	0.798
Number of banks	98	98	98	98	98	98	98	98

Regulatory Actions Affecting CoCos' Going-Concern Quality

- In January 2016, Deutsche Bank reported a loss that caused turmoil in the CoCo market over fears that a December 2015 EBA ruling on banks' Maximum Distributable Amount (MDA) would cancel payment of coupons on CoCos (c.f., a write down).
- However, in an apparent reversal, on 10 March 2016 the European Commission issued a clarification that reduced the likelihood of coupon cancellation, which Glasserman and Perotti (2017) interpret as a "retreat" by regulators.
- Another regulatory action, or lack of one, relates to Spain's Banco Popular, which had two EC CoCos, one with a "high" 7% CET1/RWA trigger and the other with a "low" 5.125% trigger.
- The bank failed on 7 June 2017 without either converting. Shareholders, CoCo investors, and Tier 2 subordinated debt investors were completely wiped out.

Examining CoCos' Reactions to Regulatory Events

- Both the 10 March 2016 EC announcement and lack of Banco Popular's CoCo conversion prior to its 7 June 2017 failure were events that may have reduced π, the probability of loss absorption while a bank is a going-concern.
- Our model predicts that a decrease in π lowers a CoCo's credit spread relative to that of "gone-concern" subordinated debt.
- We examine the average difference between bank *i*'s CoCo credit spread and its subordinated debt CDS spread over a period of *n* days before and *n* days after these two events:

$$AVG_i^k = \frac{1}{n}\sum_{t=1}^{n}\left(s_{i,t}^{CoCo} - s_{i,t}^{CDS}\right) \quad \text{where } k = \text{ before, after}$$

The 10 March 2016 European Commission Announcement

- The shorter event window is more relevant since the longer one includes the period prior to the Deutsche Bank turmoil.

Short event window (-20; + 20) around the announcement

All CoCos (54 obs)

	Average Difference	Minimum	Maximum
Before	502.16	-115.56	849.70
After	443.68	-150.27	736.69

No. of obs. for which the difference decreases: 43

No. of obs. for which the difference increases: 5

Equity conversion CoCos (22 obs)

	Average Difference	Minimum	Maximum
Before	602.35	0.00	849.70
After	535.59	0.00	739.69

No. of obs. for which the difference decreases: 19

No. of obs. for which the difference increases: 0

Write-down CoCos (32 obs)

	Average Difference	Minimum	Maximum
Before	433.28	-115.56	762.21
After	380.49	-150.27	689.29

No. of obs. for which the difference decreases: 24

No. of obs. for which the difference increases: 5

Long event window (-60; + 60) around the announcement

All CoCos (52 obs)

	Average Difference	Minimum	Maximum
Before	421.96	-67.54	670.88
After	441.84	-567.11	822.11

No. of obs. for which the difference decreases: 7

No. of obs. for which the difference increases: 38

Equity conversion CoCos (22 obs)

	Average Difference	Minimum	Maximum
Before	503.28	0.00	670.88
After	558.17	0.00	822.11

No. of obs. for which the difference decreases: 0

No. of obs. for which the difference increases: 19

Write-down CoCos (30 obs)

	Average Difference	Minimum	Maximum
Before	362.33	-67.54	642.36
After	356.54	-567.11	698.23

No. of obs. for which the difference decreases: 7

No. of obs. for which the difference increases: 19

The 7 June 2017 Banco Popular Failure

- The longer event window might be more relevant since a month prior to its failure, a run on deposits had begun and Banco Popular's stock price was already very low.

Short event window (-20; + 20) around the announcement				**Long event window (-60; + 60) around the announcement**			
	All CoCos (39 obs)				*All CoCos (39 obs)*		
	Average Difference	Minimum	Maximum		Average Difference	Minimum	Maximum
Before	263.96	-240.95	415.07	Before	271.73	-247.35	425.08
After	276.38	-213.19	427.26	After	243.93	-194.31	401.49
No. of obs. for which the difference decreases: 4				No. of obs. for which the difference decreases: 27			
No. of obs. for which the difference increases: 25				No. of obs. for which the difference increases: 8			
	Equity conversion CoCos (19 obs)				*Equity conversion CoCos (18 obs)*		
	Average Difference	Minimum	Maximum		Average Difference	Minimum	Maximum
Before	304.46	-5.17	415.07	Before	323.61	-12.74	425.08
After	320.74	0.00	427.26	After	296.59	0.00	401.49
No. of obs. for which the difference decreases: 3				No. of obs. for which the difference decreases: 11			
No. of obs. for which the difference increases: 13				No. of obs. for which the difference increases: 4			
	Write-down CoCos (27 obs)				*Write-down CoCos (21 obs)*		
	Average Difference	Minimum	Maximum		Average Difference	Minimum	Maximum
Before	225.49	-240.95	358.92	Before	227.26	-247.35	377.98
After	234.23	-213.19	382.08	After	198.80	-194.31	344.78
No. of obs. for which the difference decreases: 1				No. of obs. for which the difference decreases: 16			
No. of obs. for which the difference increases: 12				No. of obs. for which the difference increases: 4			

Conclusions

- Our model shows that if a bank's CoCo is (*is not*) expected to be written down or converted to a loss prior to insolvency, then its stock returns should be less (*more*) extreme.
- We find evidence that EC, but not WD, CoCos lower stock return volatility, consistent with them being going-concern capital.
- Yet recent regulatory actions appear to reduce the likelihood that CoCos will convert while a bank is a going concern.
- Regulatory capital ratios or regulator discretion appear to be problematic triggers, and ones linked to market values of bank equity may be needed.